

Notice of Allowability

Application No.

09/710,218

Examiner

Li B. Zhen

Applicant(s)

HARRIS, TIMOTHY L.

Art Unit

2194

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response filed 04/26/2006 and interview of 6/28/2006.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

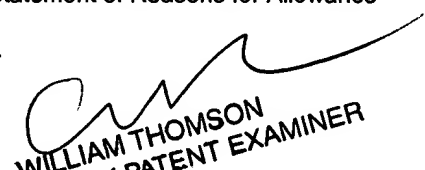
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 2/13/06;4/26/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 6/28/06
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


WILLIAM THOMSON
SUPERVISORY PATENT EXAMINER

DETAILED ACTION

1. Claims 1 – 30 are presented for examination.

INTERVIEW SUMMARY

2. Examiner conducted a telephone interview with the applicant's representatives (David O'Brien and Steven R. Gilliam) on 4/19/2006 about the 112 first paragraph rejections in the Non Final Office Action dated 01/26/2006. The written description rejection should be withdrawn because although the specification discloses an embodiment that requires a double CAS [p. 32, lines 5 – 13], the claims require a single CAS ["the first synchronization primitive atomically examines and updates a single target, the updating being conditional on the examination"]. Therefore, the applicant is only claiming the embodiment that requires a synchronization primitive atomically examines and updates a single target, the updating being conditional on the examination [i.e. CAS operation] and the specification provides support for a single CAS embodiment [i.e. p. 24, line 16 – p. 25, line 7]. Applicant's arguments are persuasive and the 112 first paragraph rejections are withdrawn.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Steven R. Gilliam (Reg. No. 51,734) on 6/28/2006.

The application has been amended as follows:

- a. Claim 1, line 1, insert after "representation" -- encoded in a computer-readable medium, --;
- b. Claim 7, line 1, insert after "representation" -- encoded in a computer-readable medium, --;
- c. Claim 26, line 1, replace "A computer program product" with -- The computer program product --;
- d. Claim 27, line 1, replace "A computer program product" with -- The computer program product --; and
- e. Claim 28, line 1, replace "A computer program product" with -- The computer program product --.

REASONS FOR ALLOWANCE

4. The following is an examiner's statement of reasons for allowance:

The prior art of record does not expressly teach or render obvious the invention as recited in independent claims 1, 7, 16 and 25.

The prior art teaches a non-blocking [Section 2.3, p. 2 of Massalin] concurrent shared object representation [Section 2.3, p. 2 of Massalin], a linked-list of nodes [Section 3.3, p. 5 of Massalin], linearizable operations defined to implement insert and remove operations on the group [Section 3.3, p. 5, second paragraph and Section 3.3,

Art Unit: 2194

p. 6 of Massalin], and a first synchronization primitive [Section 3.3, p. 6 of Massalin] to encode a marked node indication signifying logical deletion of a corresponding one of the values from the group [p. 6, Section 3.3 of Massalin]. Massalin discloses a dual compare and swap synchronization primitive to encode a marked node indication signifying the logical deletion of the node [Section 3.3, p. 6], which examines and updates two targets. Therefore, the prior art does not disclose the first synchronization primitive atomically examines and updates a single target, the updating being conditional on the examination. Although Srinivas discloses a synchronization primitive atomically examines and updates a single target [CAS; col. 12, lines 28 – 67], Srinivas does not disclose the use of a CAS to mediate concurrent execution of insert and remove operations by encoding a marked node indication signifying logical deletion of a corresponding value [p. 6, lines 13 – 16 of Appeal Brief filed on 10/31/2005].

In addition, the prior art of record does not provide a basis of evidence for asserting a motivation that one of ordinary skill level in the art at the time the invention was made would have integrated or modified the non-blocking concurrent shared object representation to incorporate the feature of using a first synchronization primitive that atomically examines and updates a single target, the updating being conditional on the examination to mediate concurrent execution of insert and remove operations by encoding a marked node indication signifying logical deletion of a corresponding value as recited in the context of independent claims 1, 7, 16 and 25. As argued by the applicant in the Appeal Brief filed on 10/31/2005 [i.e. pp. 6-7], one cannot merely replace a DCAS with a CAS operation while maintaining any semblance of a pre-existing

Art Unit: 2194

algorithmic approach to managing concurrency. The CAS-based algorithm typically requires different concurrency management techniques. Any proposed substitution [replacing a DCAS with a CAS operation] would change the principle of operation of Massalin, as well as requiring substantial modification to Massalin that cannot be done without the aid of Applicant's disclosure [p. 9 of the Appeal Brief]. In view of these arguments, examiner notes that it would not have been obvious for one of ordinary skill level in the art at the time the invention was made to integrate or modify the system of Massalin with the system of Srinivas.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

CONTACT INFORMATION

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li B. Zhen whose telephone number is (571) 272-3768. The examiner can normally be reached on Mon - Fri, 8:30am - 5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Thomson can be reached on 571-272-3718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2194

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit 2194

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